

I. PATENT ABSTRACTS OF JAPAN

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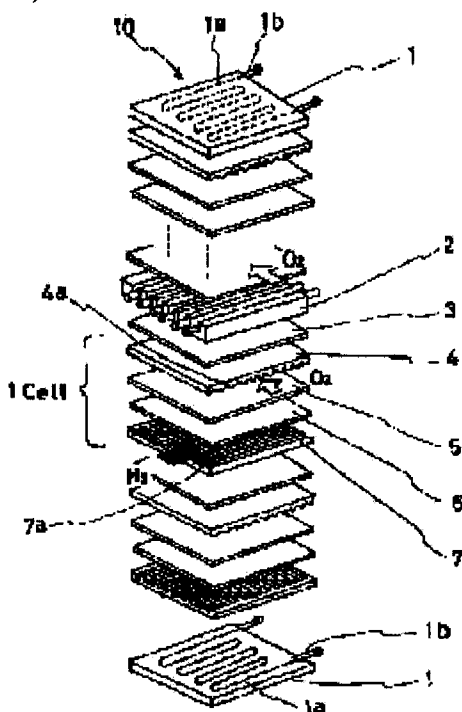
(21)Application number : 03-249593

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(22)Date of filing : 27.09.1991

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(54) FUEL CELL



(57)Abstract:

PURPOSE: To ensure protection after stop of operation and improve the life of an electrode and cell and shorten the rise-up time at the time of restart.

CONSTITUTION: In a fuel cell where hydrogen is led to a fuel-pole-side electrode 6 and oxygen is led to an air-pole-side electrode 5 to generate electricity, the upper and lower portions of the fuel cell are held between insulating plates 1 where PTC heaters 1a having PTC characteristics are respectively arranged.

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2. **** shows the word which can not be translated.

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CLAIMS

[Claim(s)]

[Claim 1] A fuel cell characterized by pinching with an electric insulating plate characterized by comprising the following by which a PTC heater has been arranged.

A fuel electrode lateral electrode.

An air pole lateral electrode.

In a fuel cell which introduces hydrogen into a fuel electrode lateral electrode, introduces oxygen into an air pole lateral electrode, and generates electrical and electric equipment, it is a PTC characteristic about the upper and lower sides of said fuel cell.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] Especially this invention relates to a pyrogenetic-reaction type fuel cell about a fuel cell.

[0002]

[Description of the Prior Art] When it is a high temperature form type of the reaction temperature of a fuel cell, in the reaction temperature, as for 130-150 ** and a phosphoric acid type electrolyte type, 180-210 ** and a melting carbonate electrolyte type will be 630-670 **, and the elevated-temperature solid oxide type can also be -1000 ** in a solid organicity type electrolyte (SPE) type. After having returned to ordinary temperature, before reaching at elevated-temperature time, time will be taken, and incubation is more nearly required because of protection of an electrode after 1 shutdown than because of this reaction temperature.

[0003] 2) In order to shorten the build up time at the time of a reboot, the good heater of a response is required.

[0004] 3) At the time of incubation, in order for necessity etc. to ask for and put in practical use the temperature control that the temperature of a cell proper does not rise too much, the technical problem which simplifies the above-mentioned item occurred.

[0005] According to this, it is a type made to circulate through an electrolysis solution as shown in JP, 57-55070, A as conventional technology, and it is forming a heater in a part of circulating route, and the fuel cell with the good movement characteristic is proposed.

[0006]

[Problem(s) to be Solved by the Invention] However, since a Prior art circulated through a strong base to an electrolysis solution, there was a problem of corrosion fatigue (life) of the whole device.

[0007] The water vapor (water) of the air and carbon dioxide were inhaled, concentration fell to the electrolysis solution, and it became a cause of the output down.

[0008] This invention makes it the technical problem to solve the above-mentioned problem, can perform protection after shutdown certainly, can expect the improvement in a life of an electrode-cell, and provides shortening of the build up time at the time of a reboot.

[0009]

[Means for Solving the Problem] In a fuel cell which technical means for attaining the above-

mentioned purpose introduce hydrogen into a fuel electrode lateral electrode, an air pole lateral electrode, and a fuel electrode lateral electrode, introduces oxygen into an air pole lateral electrode, and generates electrical and electric equipment, It is in a fuel cell characterized by pinching with an electric insulating plate by which a PTC heater which has a PTC characteristic has been arranged in the upper and lower sides of said fuel cell.

[0010]

[Example]Hereafter, about one example of this invention, drawing 1 - drawing 3 are referred to, and are explained.

[0011]Drawing 1 is an exploded perspective view of the former to a certain phosphoric acid fuel cell 10. The cold plate 2 which becomes order from the electric insulating plate 1 and a carbon plate from 1 cell, It comprises the carbon sheet 3, the fluting air pole side separator 4 which consists of carbon plates, the air pole lateral electrode 5 which consists of carbon platinum, the fuel electrode lateral electrode 6 which consists of carbon platinum, and the fluting fuel electrode side separator 7 which consists of carbon plates.

[0012]The air which contains oxygen in two or more air induction 4a allocated by the fluting air pole side separator 4 is introduced. On the other hand, hydrogen is introduced into two or more air induction 7a of the fluting fuel electrode lateral electrode 7 allocated in said fluting air pole side separator 4 and rectangular directions by the fluting fuel electrode side separator 7. By such composition, it is generated by oxygen ion in the air lateral electrode 5, and a hydrogen ion occurs in the fuel lateral electrode 6. The hydrogen ion of the fuel electrode lateral electrode 6 can draw near to the oxygen ion of the air pole lateral electrode 5 between the air pole lateral electrode 5 and the fuel electrode lateral electrode 6, and the generation reaction of hydrogen and oxygen arises. When the electron e moves a lead simultaneously, current occurs.

[0013]Since it is the same as a common phosphoric acid fuel cell about explanation in other details, it omits here.

[0014]The electric insulating plate 1 allocated in the upper and lower sides of the above-mentioned fuel cell body 10 consists of alumina ceramics, and the electric insulating plate 1 binds a fuel cell body tight with a bolt etc.

[0015]It has a heater function on one side of this electric insulating plate 1, and looped shape PTC heater 1a which gave self-temperature control is made to allocate in it. The terminal 1b is formed in the both ends of this PTC heater 1a. When this PTC (Positive Temperature Coefficient) heater 1a reaches a certain temperature (Curie point), it is a thermal resistance element with the right temperature characteristics which show increase of resistance. Therefore, current will increase and PTC which applied voltage and carried out self-generation of heat will be stabilized at an almost fixed temperature, if temperature falls. That is, PTC plays the role of both a heating element and a thermoregulator.

[0016]That is, if PTC heater 1a becomes a certain preset temperature, it will cut off the electrical and electric equipment from the terminal 1b, and when the temperature of a main part falls, the electrical and electric equipment flows again and it has a function of a heater, and an autogenous control function.

[0017]This PTC heater 1a is allocated by screen-stencil, and has shape bent two or more boxes to 1 mm in thickness, and about [width 5mm] loop shape.

[0018]In this invention, although the PTC heater is arranged on the electric insulating plate 1, a PCT heater may also be embedded at an electric insulating plate.

[0019]

[Effect of the Invention]This invention has the following effects as above.

[0020]In the fuel cell of a high temperature form, protection after 1 shutdown can be performed certainly and the improvement in a life of an electrode-cell is possible.

[0021]2) Shortening of the build up time at the time of a reboot is possible.

[0022]3) By applying PTC, it is a temperature-control system (it limits at the time of incubation.) of a cell proper.

[0023]The simplification of correspondence is attained in heating and a cooling system during an operation.

TECHNICAL FIELD

[Industrial Application]Especially this invention relates to a pyrogenetic-reaction type fuel cell about a fuel cell.

PRIOR ART

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EFFECT OF THE INVENTION

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MEANS

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]The exploded perspective view of the fuel cell of this invention.

[Drawing 2]The top view of the electric insulating plate with which the PTC heater has been arranged.

[Drawing 3]The side view of the electric insulating plate with which the PTC heater has been arranged.

[Description of Notations]

1a Electric insulating plate,

1b PTC heater,

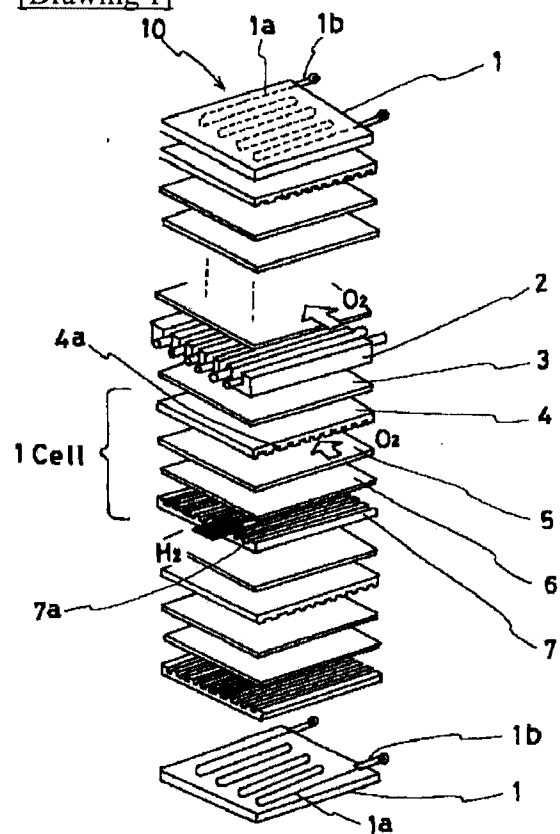
5 Air pole lateral electrode,

6 Fuel electrode lateral electrode,

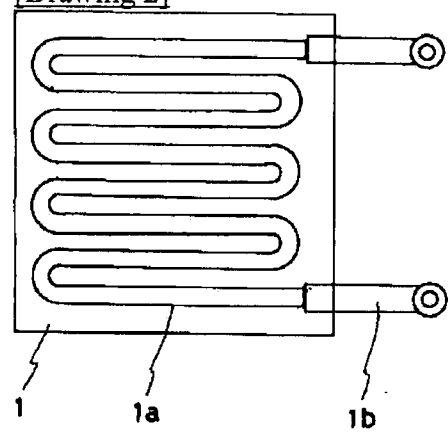
10 Fuel cell.

DRAWINGS

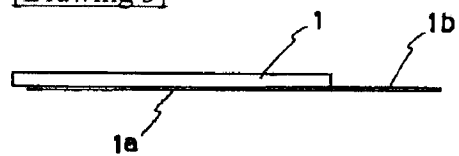
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]